

INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 2004	Park: Shenandoah NP
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Permit#: SHEN-2004-SCI-0013	
Park-assigned Study Id. #: SHEN-00300	
Project Title: Effects of roads on gene flow in terrestrial salamanders	
Permit Start Date: Jun 07, 2004	Permit Expiration Date Oct 31, 2005
Study Start Date: Jun 07, 2004	Study End Date Oct 31, 2004
Study Status: Completed	
Activity Type: Research	
Subject/Discipline: Herpetology (Amphibians / Reptiles)	
Objectives: <p>Roads may be important contributors to habitat fragmentation in terrestrial animals. Fragmentation effects can include edge effects and reduced dispersal and gene flow among populations. Theoretical and empirical research suggest that these effects can reduce the long term viability of populations.</p> <p>We are investigating the effects of roads on gene flow and population structure in the red-backed salamander, <i>Plethodon cinereus</i>, a terrestrial salamander common to Eastern North America. We are collecting genetic samples from red-backed salamanders at eight roadside sites. At each site, we are collecting 50 genetic samples from each of four 50 m x 50 m plots separated by 200 m. The four plots are arranged at the vertices of a square with the road passing through the center such that two plots are on each side of the road. By comparing the genetic distance among plots on the same side of the road to the genetic distance among equidistant plots on opposite sides of the road, we can determine the extent to which roads are barriers to dispersal and gene flow for these salamanders. We are also choosing roads that vary in width and age. This will allow us to determine how these factors affect the magnitude of road effects on salamanders.</p> <p>We have completed analysis for three of the eight sites (rt. 460 in Montgomery County, rt. 613 in Giles County, and the Blue Ridge Parkway in Augusta County (approved under a previous NPS permit in 2003)). We are currently collecting samples from three additional sites (I-64 in Albemarle County, rts. 458 and 635 in Giles County). We believe that both route 33 and route 211 in Shenandoah National Park would make excellent candidates for additional sites for this study. We are currently requesting permission to include these two sites.</p>	
Findings and Status: <p>We have now extracted DNA from tail tips from 196 red-backed salamanders along rt. 33 in Shenandoah National Park. We are in the final stages of genotyping these animals at seven microsatellite loci. Preliminary analyses suggest that there is little genetic differentiation between salamander</p>	

populations on opposite sides of the road, as compared to equally spaced populations in continuous forest. We elected to not use the approved site along rt. 211.	
For this study, were one or more specimens collected and removed from the park but not destroyed during analyses? No	
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Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college	
Full name of college or university: 0	Annual funding provided by NPS to university or college this reporting year: 0